Agilent Technologies
Innovating the HP Way

Troubleshooting Guide for the Sample Transport Assembly

This troubleshooting guide is meant to help you diagnose and repair G1313A and G1329A sampler problems.

In general, sampler problems can be divided into three categories.

1 Intermittent lock-ups with or without vial in the gripper fingers

with Error messages	motor overtemp (0 or 1 or 2 or 3)
	movement failed (0 or 1 or 2 or 3)
	missing vial

Many times the sampler is being used very heavily.

2 Jittery (shaky) movement in X and/or theta axes and/or when the needle goes through the gripper arm into the vial.

with Error messages	motor overtemp (0 or 2)
	movement failed (0 or 2)

3 Poor alignment, seen during vial pickup and vial replacement and/or when the needle hits the gripper arm.

with Error messages	motor overtemp (0 or 2 or 3)
	movement failed (0 or 2 or 3)
	missing vial

NOTE Motor 0=X ; 1=Z ; 2=Theta ; 3=Gripper.

The following pages list these three problem categories with a list of suggestion.

Intermittent lock-ups with or without vial in the gripper fingers

with Error messages	motor overtemp (0 or 1 or 2 or 3)
	movement failed (0 or 1 or 2 or 3)
	missing vial

NOTE When a motor over temperature message has occurred, the sampler must be turned off for about 10 minutes to allow the motor to cool down.

STEP 1: **Check the firmware and update to the latest revision if necessary.**

Since firmware revision A.03.61 (resident A03.60) most “movement failed”, “motor over temp”, “initialization failed (X-axis)” errors are solved.

STEP 2: **Check the vials and the caps.**

For reliable operation, vials used with the 1100 Autosampler must not have tapered shoulders or caps that are wider than the body of the vial. For more details see the service note G1313-017.

STEP 3: **Very heavy usage - use a macro.**

A pre-sequence macro Inj_rset.mac will automatically reset the sampler at the start of a sequence (ChemStation).

STEP 4: **Check if the “INJECT” line is used in the “Injector Program”.**

Remove this line from the program. In this mode the system does not need this command to do the injection.

A firmware revision (>3.81) will address this problem. For more details see the service note G1313-018.

STEP 5: **Reset the sampler alignment to default value.**

Reset tray alignment, and transport alignment is possible with the Control Module and the ChemStation. To reset the transport alignment with the ChemStation, enter following command in the command line. Print sendmodule$(lals, “tray:alig 0.00,0.00”)

STEP 6: **Check the tension of the belts.**

For this use the Torque2.mac. and measure the torque for each axis.

Typical ranges	Theta (both)	30-50
	X-axis (both)	50-90
	Z-axis (both)	90-130
	Gripper open	30-65
	Gripper closed	maximum 30

If the Gripper open/closed torque is not in the range, proceed with STEP 7. If the theta or X torque is not in the range, proceed with STEP 8 (if you think you can adjust the torque), otherwise proceed with STEP 9.

STEP 7: **Exchange the gripper arm assembly (part number G1313-60010).**

STEP 8: **Adjust the belt tension.**

- If the measured torque value is too low, the belt needs to be tightened.
- If the measured torque value is too high, the belt needs to be loosened.

For this, slide the motor (X or teta) on the holder bracket in the appropriate direction and test the tension with the torque2 macro. Repeat this steps until the values are in the appropriate torque range.

STEP 9: **Exchange the sample transport assembly (part number G1313-60009 or G1329-60009).**

STEP 10: **Exchange the main board (part number G1313-69520 or G1329-69520).**

Jittery (shaky) movement in X and or theta axes and/or when the needle goes through the gripper arm into the vial

with Error messages	motor overtemp (0 or 2)
	movement failed (0 or 2)

NOTE When a motor over temperature message has occurred, the sampler must be turned off for about 10 minutes to allow the motor to cool down.

STEP 1: **Check the firmware and update to the latest revision if necessary.**

Since firmware revision A.03.61 (resident A03.60) most of following errors “movement failed”, “motor over temp” and “initialization failed (X-axis)” are solved.

STEP 2: **Check the cleanliness of the transport rods (X-axis) and clean them.**

If the rod is dirty or sticky, clean it with Isopropanol and wipe it with a lint free cloth. The rod can be lubricated with the following synthetic oil: part number 6040-0854.

NOTE DO NOT use other lubricant as mentioned above.

STEP 3: **Lubricate the X-gear.**

Friction can result in the belt slipping on the gear so that the position of the belt teeth towards the gear changes.

To avoid this, apply some grease from the sample transport repair kit to the X-motor-gear.

NOTE Do not use other grease as the one in the kit and carefully follow the instruction from the technical note.

STEP 4: **Check the tension of the belts.**

For this use the Torque2.mac and measure the torque for theta and X-axis.

Typical range	Theta (both)	30-50
	X-axis (both)	50-90

- If the theta or X torque is not in the range, proceed with STEP 5 (if you think you can adjust the torque). Otherwise proceed with STEP 7.

STEP 5: **Adjust the belts tension.**

- If the measured torque value is too low, the belt needs to be tightened.
- If the measured torque value is too high, the belt needs to be loosened.

For this, slide the motor (X or teta) on the holder bracket in the appropriate direction and test the tension with the torque2 macro. Repeat this steps until the values are in the appropriate torque range.

STEP 6: **Reset the sampler alignments to default value.**

Reset tray alignment, and transport alignment is possible with the Control Module and the Chemstation. To reset the transport alignment with the Chemstation enter following command in the command line.

Print sendmodule$(lals, “tray:alig 0.00,0.00”)

STEP 7: **Exchange the sample transport assembly (part number G1313-60009 or G1329-60009).**

STEP 8: **Exchange the main board (part number G1313-69520 or G1329-69520).**

Poor alignment, seen during vial pickup and vial replacement and/or when the needle hits the gripper arm

with Error messages	motor overtemp (0 or 2 or 3)
	movement failed (0 or 2 or 3)

NOTE When a motor over temperature message has occurred, the sampler must be turned off for about 10 minutes to allow the motor to cool down.

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Poor alignment, seen during vial pickup and vial replacement and/or when the needle hits the gripper arm

STEP 4: **Check the tension of the belts.**

For this use the Torque2.mac. and measure the torque for each axis.

Typical ranges	Theta (both)	30-50
	X-axis (both)	50-90
	Z-axis (both)	90-130
	Gripper open	30-65
	Gripper closed	maximum 30

- If the Gripper open/closed torque is not in the range, proceed with STEP 5.
- If the theta or X torque is not in the range, proceed with STEP 6 (if you think you can adjust the torque), otherwise proceed with STEP 7.

STEP 5: **Exchange the gripper arm assembly (part number G1313-60010).**

The gripper arm exchange procedure is explained in the reference manual G1313-90002, section "*Repairing the Autosampler*".

STEP 6: **Adjust the belts tension.**

- If the measured torque value is too low, the belt needs to be tightened.
- If the measured torque value is too high, the belt needs to be loosened.

For this, slide the motor on the holder bracket in the appropriate direction and test the tension with the torque2 macro. Repeat this steps until the values are in the appropriate torque range.

STEP 7: **Exchange the sample transport assembly (part number G1313-60009 or G1329-60009).**

STEP 8: **Exchange the main board (part number G1313-69520 or G1329-69520).**

Additional information about the G1313A and the G1329A

- **New leak plane design (part number G1313-44501)**

  To reduce the siphoning effect when the valve is in bypass mode and therefore the introduction of small amount of air.

  To avoid leak caused by improper solvent drainage with the 900 µl loop assembly.

- **Temperature sensor failed on the G1330A thermostat**

  Check the location of the data communication (HPIB or LAN). HPIB or LAN must be connected to the detector, if one is in the system. Otherwise to the pump.

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